

**REMARKS**

Claims 1-13, 24, 25, 29-31, 34-36, and 40-57 were pending in the application. Claims 3, 4, 10-13, 24, 25, 29-31, 36, and 41-47 have been withdrawn from consideration by the Examiner as being drawn to a nonelected species. Claims 1-11, 13, 24, 25, 29-31, 34-36, and 40-52 have been amended. No new matter has been introduced. Thus, claims 1, 2, 5-9, 34, 35, and 40 are submitted for reconsideration at this time.

Applicants thank the Examiner for acknowledging receipt of the foreign priority documentation in the pending application.

**Rejection Under 35 U.S.C. §112, ¶2**

Claims 1, 2, 5-9, 34, 35 and 40 stand rejected under 35 U.S.C. §112, ¶2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, claim 1 is allegedly indefinite because it uses "FRP" to designate a fiber reinforced plastic. Applicants have amended claim 1 to recite "Fiber Reinforced Plastic (FRP)" accordingly. Withdrawal of the rejection under 35 U.S.C. §112, ¶2 is earnestly solicited.

**Prior Art Rejections**

Claims 1, 2, 5, 6, and 40 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,819,978 ("Hlebovy" hereafter). Claims 1, 2, 5, 6, and 40 also stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hlebovy. Claims 7 and 9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hlebovy in view of U.S. Patent No. 5,829,418 ("Tamura" hereafter). Claims 34 and 35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hlebovy in view of U.S. Patent No. 5,025,943 ("Forsman" hereafter). Applicants respectfully traverse these rejections for at least the following reasons.

Hlebovy and Tamura are not available as prior art under 35 U.S.C. §102(e). Specifically, Hlebovy is available as prior art as of its April 24, 1997 U.S. filing date. Tamura is available as prior art as of its April 14, 1997 U.S. filing date. The pending application, however, claims priority back to PCT application PCT/JP95/02472 filed December 4, 1995, which is prior to both Hlebovy and Tamuras' effective prior art dates. Moreover, the Examiner acknowledged receipt of the priority documentation in the pending action in item 13(a)(1) of the Office Action Summary. Withdrawal of the prior art rejections is earnestly solicited.

As generic claim 1 is considered allowable for the aforementioned reasons, Applicants also respectfully request rejoinder of claims 3, 4, 10-13, 24, 25, 29-31, 36, and 41-47, which are generally dependent upon claim 1.

**Conclusion**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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Date

  
Phillip J. Artigola  
Attorney for Applicant(s)  
Reg. No. 38,819

FOLEY & LARDNER  
Suite 500, 3000 K Street, N.W.  
Washington, D.C. 20007-5109  
Phone: (202) 672-5300  
Fax: (202) 672-5399

**Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge deposit account No. 19-0741 for any such fees; and applicant hereby petitions for any needed extension of time.**

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. (Amended) A pressure vessel, comprising:

an inner shell capable of serving as a gas barrier and a pressure resistant outer shell provided to cover the inner shell, which said outer shell is made of [an] a Fiber Reinforced Plastic (FRP) comprising reinforced fibers and a resin and of 35 GPa or more in tensile modulus and 1.5% or more in tensile breaking strain.

2. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell is made of a metal, resin or FRP.

3. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell has a gas barrier layer formed on the inside surface and/or outside surface.

4. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell has a body portion, on which a reinforcing layer made of [an] a FRP is formed.

5. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the outer shell is 35 GPa or more in tensile modulus and 1.7% or more in tensile breaking strain.

6. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the outer shell is 35 GPa or more in tensile modulus and 2.0% or more in tensile breaking strain.

7. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the reinforcing fibers comprise carbon fiber yarns of 4.5 GPa or more in strand tensile strength and 2.0% or more in strand tensile breaking strain.

8. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the reinforcing fibers comprise carbon fiber yarns of 5.5 GPa or more in strand tensile strength and 2.0% or more in strand tensile breaking strain.

9. (Twice Amended) A pressure vessel of claim 7 [characterised in that] wherein the reinforcing fibers comprise carbon fiber yarns of 0.30 or less in oxygen ratio at surface and 0.02 or more in nitrogen at surface.

10. (Twice Amended) A pressure vessel of claim 5 [characterised in that] wherein the outer shell comprises a layer of reinforcing fibers arranged, with reference to the axial direction of the pressure vessel, at an angle within a range from  $\pm 5^\circ$  to  $\pm 50^\circ$  and a layer of reinforcing fibers arranged at an angle within a range from  $\pm 75^\circ$  to  $\pm 105^\circ$ .

11. (Twice Amended) A pressure vessel of claim 1 [characterised in that] wherein the outer shell comprises a layer of reinforcing fibers arranged, with reference to the axial direction of the pressure vessel, at an angle within a range from  $\pm 0^\circ$  to  $\pm 15^\circ$ , a layer of reinforcing fibers arranged at an angle within a range from  $\pm 75^\circ$  to  $\pm 105^\circ$  and a layer of reinforcing fibers arranged at an angle within a range from  $\pm 30^\circ$  to  $\pm 60^\circ$ .

13. (Amended) A pressure vessel of claim 11 [characterised in that] wherein the volume ratio of reinforcing fibers in the layers of reinforcing fibers arranged, with reference to the axial direction of the pressure vessel, at an angle within a range from  $\pm 0^\circ$  to  $\pm 15^\circ$ : that in the layer of reinforcing fibers arranged at an angle within a range from  $\pm 75^\circ$  to  $\pm 105^\circ$ : that in the layer of reinforcing fibers arranged at an angle within a range from  $\pm 30^\circ$  to  $\pm 6^\circ$  is in the range of 1:1.5-2.5:0.2-1.2.

24. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the pressure vessel has a body portion, and the outer shell has a layer structure of 5 or more layers around the body portion, the relation between the total thickness T (mm) of all the layers and the number N of the layers, satisfying  $0.5 \leq T/N \leq 6$ .

25. (Amended) A pressure vessel of claim 24 [characterised in that] wherein, in said body portion, layers with reinforcing fibers hoop-wound and layers with reinforcing fibers helically wound are alternately arranged in the thickness direction of the outer shell.

29. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the outer shell comprises the following components [X], [Y] and [Z], and the component [Z] is localized around the component [X] appearing in a cross sectional face of the outer shell:

[X] : a reinforced fiber bundle

[Y] : a thermosetting resin

[Z] : an elastomer and/or thermoplastic resin.

30. (Amended) A pressure vessel of claim 29 [characterised in that] wherein the ratio  $L_2/L_1$  satisfies  $1/100 \leq L_2/L_1 \leq 1/2$ , where  $L_1$  is the length of a straight line connecting the geometrical centers of two adjacent component [X],  $L_2$  is the length of a portion of the straight line crossing the component [Z] present between the said two adjacent component [X].

31. (Amended) A pressure vessel of claim 29 [characterised in that] wherein the component [Z] comprises at least one selected from the group consisting of polyvinyl acetate, polyamides, polycarbonates, polyacetals, polyphenylene oxide, polyphenylene sulfide, polyallylates, polyesters, polyamidimides, polyimides, polyether imides, polysulfones, polyether sulfones, polyether ether ketone, polyaramid, polybenzimidazole, polyethylene, polypropylene, cellulose acetate, cellulose butyrate, polyester based thermoplastic elastomers and polyamide based thermoplastic elastomers.

34. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the outer shell comprises a shoulder portion, and the innermost layer of the shoulder portion comprises a layer with reinforcing fibers hoop-wound.

35. (Amended) A pressure vessel of claim 34 [characterised in that] wherein the innermost layer is formed by the filament winding method.

36. (Amended) A pressure vessel of claim 34 [characterised in that] wherein the circumferential surfaces of the shoulder portion of the inner shell are formed to have steps in the axial direction, respectively extending in the circumferential direction.

40. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell comprises a neck portion, inside which a boss for nozzle installation is provided, and a seal ring is fitted on the end face of the neck portion around the boss for nozzle installation, and a pressing means is provided for pressing the seal ring toward the end face of the neck portion.

41. (Amended) A pressure vessel of claim 40 [characterised in that] wherein the pressing means comprises a seal ring pressing member and a clamp of the pressing member.

42. (Amended) A pressure vessel of claim 40 [characterised in that] wherein the pressing means comprises a pressing member threadedly engaged with the boss for nozzle installation.

43. (Amended) A pressure vessel of claim 40 [characterised in that] wherein the pressing means comprises a pressing member comprising a cylindrical portion threadedly engaged with the neck portion, and a collar portion held in contact with the seal ring.

44. (Amended) A pressure vessel of claim 40 [characterised in that] wherein the boss for nozzle installation comprises a flange portion, and the outer diameter of the pressing means is smaller than the outer diameter of the flange portion by 1 to 10 mm.

45. (Amended) A pressure vessel of claim 40 [characterised in that] wherein the end face of the neck portion comprises an annular groove provided to have the seal ring fitted therein.

46. (Amended) A pressure vessel of claim 42 [characterised in that] wherein the outer shell extends up to a position to cover the pressing member.

47. (Amended) A pressure vessel of claim 43 [characterised in that] wherein the cylindrical portion comprises a step.

48. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell comprises a neck portion; a boss for nozzle installation is provided inside the neck portion; and the surface of the boss for nozzle installation to be coupled with the neck portion has a rugged form.

49. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell comprises a neck portion; inside which a boss for nozzle installation is provided, and the surface of the boss for nozzle installation to be coupled with the neck portion has a circumferentially extending ridge.

50. (Amended) A pressure vessel of claim [49 characterised in that] 48 wherein additionally the surface to be coupled has a rugged form.

51. (Twice Amended) [The] A pressure vessel of claim 48 [characterised in that] wherein a seal ring is fitted on the end face of the neck portion around the boss for nozzle installation, and a means for pressing the seal ring toward the end face of the neck portion is provided.

52. (Amended) A pressure vessel of claim 1 [characterised in that] wherein the inner shell comprises a neck portion inside which a boss for nozzle installation is provided, and outside the neck portion a cylindrical member having a collar portion, a cylindrical portion in succession to the collar portion and a flange portion extending from the circumferential surface of the cylindrical portion into the outer shell are provided.